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(54) Title of the invention: PROGRAM RESERVATION EQUIPMENT FOR MAGNETIC RECORDING AND REPRODUCTION DEVICE

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SPECIFICATION

1. Title of the Invention

PROGRAM RESERVATION EQUIPMENT FOR MAGNETIC RECORDING AND REPRODUCTION DEVICE

2. Scope of Patent Claims

1. Program reservation equipment for a magnetic recording and production device having a means for extracting information representing time from a television signal and establishing timer settings.

3. Detailed Description of the Invention

Industrial Field of Application

The present invention relates to program reservation in a magnetic recording and reproduction device (abbreviated as "VTR" hereafter).

Prior Art

While VTRs are obviously highly valuable as time shifters, program timer reservation with a VTR is extremely bothersome.

General program reservation is performed as follows by operating buttons.

(1) Set the present date and time.
(2) Press the reservation start button.
(3) Determine the reservation channel.
(4) Determine the date.
(5) Determine how many weeks later to record.
(6) Determine the start time.
(7) Determine the stop time.
(8) Set the device to the timer recording mode.

Such operations were necessary, and time determination, in particular, was extremely bothersome because it was necessary to make "a.m.," "p.m." and "minute" settings with buttons.

An alternate example of button operation using barcodes is shown on p. 107-108 of the 10/1986 edition of "Electronics Life" published by NHK, but the only fundamental change is the means of access, and there is little difference in the trouble involved.

A conceptual diagram of the operation of this device is shown in Fig. 3, wherein 1 is an antenna which receives radio waves from a broadcast station. Symbol 2 is video signal demodulator comprising a tuner, an image intermediate wavelength signal processing circuit, and a video signal/color signal processing circuit. Symbol 3 is a recording signal processing circuit which FM-modulates brightness signals in video signals and performs low-pass conversion on chrominance signals, and 4 is a reproduction signal processing circuit which is recorded on a tape and demodulates FM-modulated signals and low-pass modulated chrominance signals into NTSC signals. Symbol 5 is a switching circuit

which switches the connection to video head 6 at the time of recording and reproduction, 7 is a servo circuit for controlling the tracing of video head 6 on a video tape, 8 is a system control circuit which controls the recording mode and the reproduction mode, 9 is a key input device for inputting information when making timer reservations, and 10 is a timer.

In the button operation for program reservation described above, information is inputted from key input device 9 by operating buttons. When the reserved time is reached, the reserved program is recorded to a magnetic tape through video signal demodulator 2, recording signal processing circuit 3, switching circuit 5, and video head 6. The recording mode at this time is controlled by system control circuit 8, which is ordered to do so by timer 10.

PROBLEM TO BE SOLVED BY THE INVENTION

In the prior art described above, extremely bothersome bottom operation was necessary as no consideration was given to the issue of program reservation simplification.

The purpose of the present invention is to provide program reservation equipment for a VTR which enables the automation of the present time settings required for program reservation and makes settings for program reservation extremely easy.

MEANS FOR SOLVING THE PROBLEM

The above objective is achieved by multiplexing information required for timer reservation with a transmitted television signal and setting the timer based on the multiplexed information in a VTR on the receiver side.

The following three types of signals are multiplexed.

(1) Code indicating the present time
(2) List of television programs (characters)
(3) Code corresponding to the list of television programs
(Start time, stop time, and program name codes)

The codes and the characters of the multiplexed signal are demodulated in the VTR. The present time of the timer is then automatically set, and the above objective is achieved by program reservation equipment which enables program reservation by simply pointing to the list of television programs with a light pen.

OPERATION

(1) When the code indicating the present time is received on the VTR side, the present time of the timer is set.
(2) Multiplexed character information is stored in field units on the VTR side, and this is turned into a list of television programs and recorded on a tape by the VTR.
(3) Similarly, the code corresponding to the list of television programs is recorded on the tape by the VTR in field units.
(4) The list of television programs recorded on the tape is reproduced, and the program to be reserved is designated with a light pen.
(5) The start time and stop time corresponding to the program are read out and the timer is set.

EMBODIMENT

An embodiment of the present invention will be described hereafter using Fig. 1 and 2. The same numbers are used for blocks common to Fig. 4 showing a conventional example.

In particular, the parts playing central roles in the present invention will be described.

Decoder 11 extracts a video signal multiplexed with an video signal.

When the multiplexed signal is a code indicating the present time or an extracted code, timer control circuit 12 converts it into a control signal for timer 10.

In all other cases, it issues a command signal instructing the storage of the multiplexed signal to field memory 19.

Program designation circuit 17 assesses the code corresponding to character information and orders a code extraction circuit to extract the code.

Code extraction circuit 18 supplies the selected code to timer control circuit 12.

EMBODIMENTS

The operations can be divided into three types.

(1) Setting of the present time of the timer
(2) Recording of the program list and its code to the video tape
(3) Reservation of the program to be reserved from the content recorded on the video tape

First, the setting of the present time of the timer will be described.

Radio waves from a broadcast station are demodulated into an video signal by tuner 1 and video signal demodulator 2, but specific symbols

indicating the present time, the program list, and its code are multiplexed with the video signal.

In the multiplexing of these symbols, one horizontal scanning interval in the vertical blanking interval, for example, is used (see Fig. 2).

The superimposed character signal and symbols are extracted by decoder 11 from the video signal with multiplexed symbols and are supplied to timer controller 12 and memory 15. When the code indicating the present time is received, the code is converted by timer controller 12 into a control signal capable of timer reservation and timer 10 is set.

In other words, this means that the present time of timer 10 can be set automatically. Next, the recording of the program list and its code to the video tape will be described.

When character information, which is the list of programs, is received, it is stored in memory 15 for each horizontal scanning interval of the superimposed character signal. When one field's worth of information is then accumulated, switch circuit 14 is activated and one field's worth of character information is recorded to the video tape through recording signal processing circuit 3, switch circuit 5, and video head 6. The program code corresponding to the character information or the symbols for the start time and stop time are similarly recorded to the tape in units of single field units.

Here, it is necessary to be aware that the program character information and its code are set such that they correspond to the same location on the television display.

A supplement to the above explanation will be given using Fig. 2. One field's worth of multiplexed character information or code in the vertical blanking interval is accumulated and recorded on the video tape in field units. Therefore, the content of the field becomes *a, b, c, d, e*... when viewing the reproduced screen on a television, for example, and the character indicating the program of image *c* is set to a position corresponding to the code of image *d*. For example, *a*, *b*, and *c* are the content of the list of television programs, and parts of television programs of a newspaper are recorded here. Each television program has codes for the program start time and stop time, and these codes are recorded in image *d*.

The character information and codes of the image are set such that they are in corresponding positions on the television screen.

Here, the purpose of recording information on the video tape in field units is to reduce memory capacity. In other words, because the list of television programs requires several weeks' worth of content, a large amount of memory becomes necessary.

Next, timer reservation settings will be described using Fig. 1. When the VTR is set to the reproduction mode, a signal recorded on the video tape are demodulated into an NTSC signal by reproduction signal processing circuit 4 through video head 6 and switch 5. A list of television programs represented by characters is then displayed on the screen of television 15. This can be thought of as images *a*, *b*, and *c* with the same content in field units as that shown in Fig. 2.

When the program to be reserved is indicated on the cathode-ray tube of the television with light pen 16, the position of the program to be reserved on the screen is stored by program designation circuit 17. For example, it would be possible to store the scan time of a beam from a horizontal synchronizing signal. When the content of image *d* in which the corresponding code of the program to be reserved is stored is inputted into program designation circuit 17, a code corresponding to the scan time of the beam is read out by code extraction circuit 18 and is supplied to timer control circuit 12. As a result, timer 10 stores the start time and the stop time of the program to be reserved, which enables the setting of the timer.

Fig. 4 shows another embodiment. This differs from the embodiment of Fig. 1 in that high-capacity memory 19 is used instead of storing the character information and code information collected in field units on the video tape.

The list of television programs spans several weeks based on the quantity required for reservation. Memory 19 must therefore have a large capacity. With this method, a magnetic tape for storing the list of television programs is unnecessary. In addition, random access is enabled by the use of semiconductor memory.

The same effects can, of course, be achieved even if memory 19 is a type of magnetic memory such as a magnetic disk.

Fig. 5 shows another embodiment. This differs from the embodiment of Fig. 1 in that programs are reserved without requiring a timer.

This is a means for making assessments using the

program name code when reserving a program rather than making reservation settings based on the start time and the stop time of the program.

The television program name code is multiplexed with a transmitted television signal immediately before each program starts. When making a reservation, the code name is stored in a program code assessment circuit 20 instead of the time, and VTR recording is begun when the code supplied from timer controller 12 [matches] this code. Recording is then terminated by detecting a program ending code that is multiplexed in advance.

This method has the advantage that a television program can be reliably recorded even if it is broadcast at a time differing from the schedule time.

Programs can be easily reserved, of course, by combining the 1st, 2nd and 3rd embodiments.

In addition, it is not necessary to require multiplexed signals to use the horizontal scanning interval in the vertical blanking interval. Voice transmission waves, for example, could alternatively be used.

Further, the invention is not limited to multiplexed signals, and information could also be broadcast as ordinary signals in the middle of the night after normal television programming is finished, for example.

Although examples using a light pen for program designation were described in this text, the same effects could, of course, be achieved using a cursor.

EFFECT OF THE INVENTION

With the present invention described above, bothersome button operations to set the present time become unnecessary, and settings can be made automatically on the VTR side.

In addition, the program reservation settings can be made automatically on the VTR side by simply indicating the name of the program to be reserved with a light pen.

4. BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a conceptual diagram showing an embodiment of the present invention. Fig. 2 is a supplementary explanatory diagram of the same. Fig. 3 is a conceptual diagram illustrating conventional program reservation. Fig. 4 and 5 are conceptual diagrams showing other embodiments of the present invention.

10…timer,
11…decoder
12…timer control circuit
13…memory
16…light pen
17…program designation circuit
18…code extraction circuit

Agent Patent Attorney Katsuo Ogawa [seal illegible]

[see source for figures]

Fig. 1

2: demodulator
7: servo
8: system control
10: timer
11: decoder
12: timer control circuit
13: memory
16: light pen
17: program designation circuit
18: code extraction circuit

Fig. 2

multiplexing
television video signal
13
field memory
vertical blanking interval
corresponding code
d
character
c
content recorded on tape
(field units)
video tape

[see source for figures]

Fig. 3

7: servo
8: system control
9: key input
10: timer

Fig. 4

7: servo
8: system control
10: timer
11: decoder
12: timer selection
19: memory

Fig. 5

7: servo
8: system control
11: decoder
13: memory

Continued from page 1:

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始時刻と終了時刻により、予約設定を行なうのではなく、番組名のコードにより判別する手段である。

送信されるテレビ信号には、各番組が始まる直前に、テレビ番組名のコードが多重されている。予約時に番組コード判別回路20に時間の代わりにコード名を記憶しておき、タイマ制御部12から供給されるコードが一致した時にVTRの記録を開始する。そして、予め多重された番組の終了コードを検出して記録の停止を行なう。

この方法の場合、テレビ番組が予定された時間と異なって放送された場合でも、狂うなく記録できる長所がある。

以上の第1図ないし第3の実施例の組み合わせる事でも、簡単な番組予約が出来る事は言うまでもない。

また、多重信号は垂直帰線消去期間内の水平走査期間を利用するものに限る必要はない。たとえば、音声搬送波等を利用してもよい。

さらに多重信号に限定する事なく、通常のテレビ番組が終了した深夜等に通常の信号として放送してもよい。

なお、本文中では、番組の指定をライトペンを使用した例を説明しているがカーソルによって行なっても同様の効果が得られる事は言うまでもない。

〔発明の効果〕

以上本発明によれば、面倒な現在時間のボタン操作が不要になり、VTR側で自動設定が行なえる。

さらに、番組の予約設定も、予約したい番組名をライトペンで指示するだけで、VTR側で自動設定が行なえる。

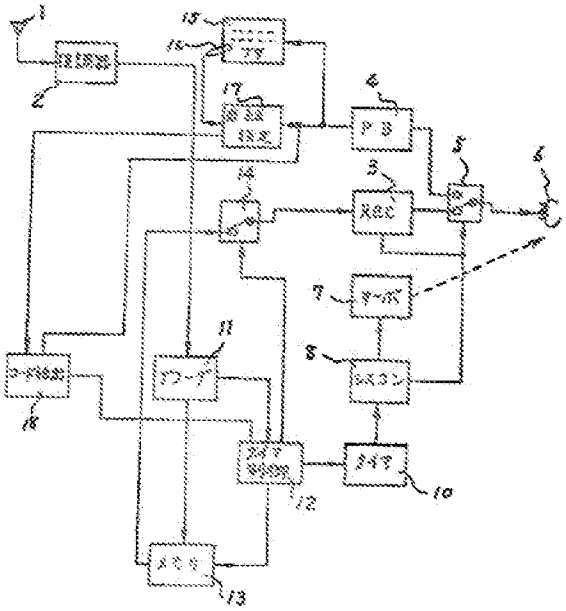
4. 図面の簡単な説明

第1図は本発明の一実施例を示す概念図、第2図は同じく動作説明図、第3図は従来の番組予約を示す概念図、第4図、第5図は本発明の別の実施例を示す概念図である。

10…タイマ、　11…デコーダ、
12…タイマ制御回路、13…メモリ、
16…ライトペン、　17…番組指定回路、
18…コード検出回路。

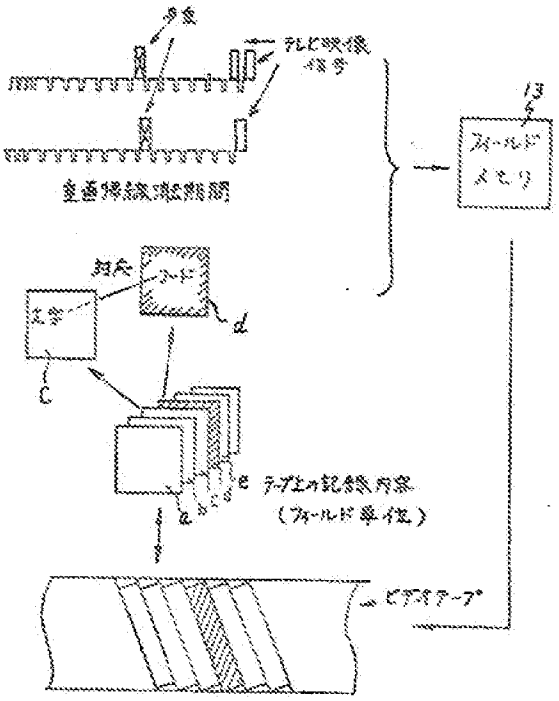
代理人弁理士　小　川　勝　男

第1図

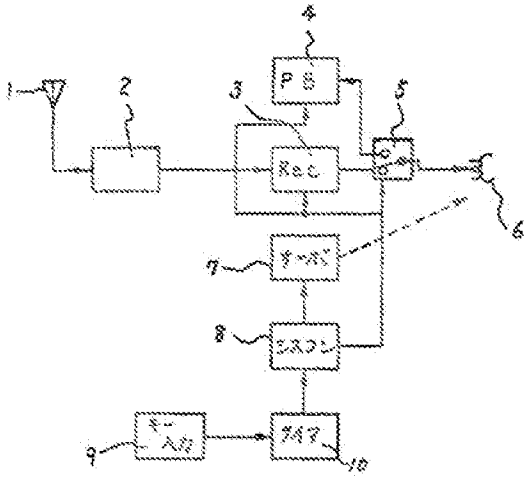


10：タイマ　　16：ライトペン
11：デコーダ　　17：番組指定回路
12：タイマ制御部　　18：コード検出回路
13：メモリ

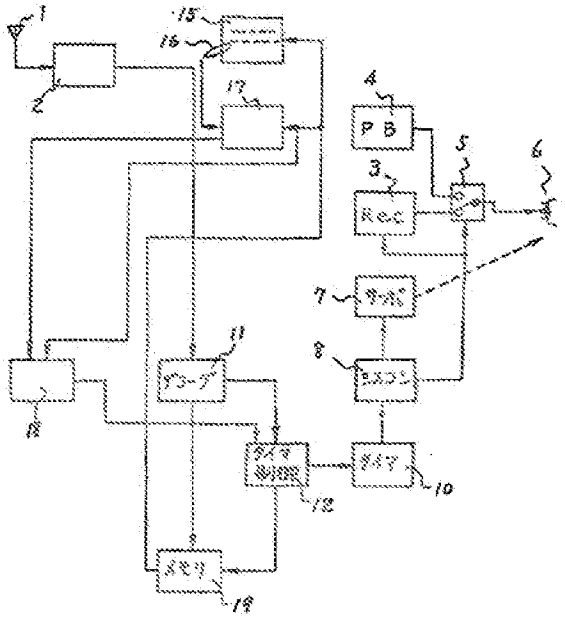
第2図



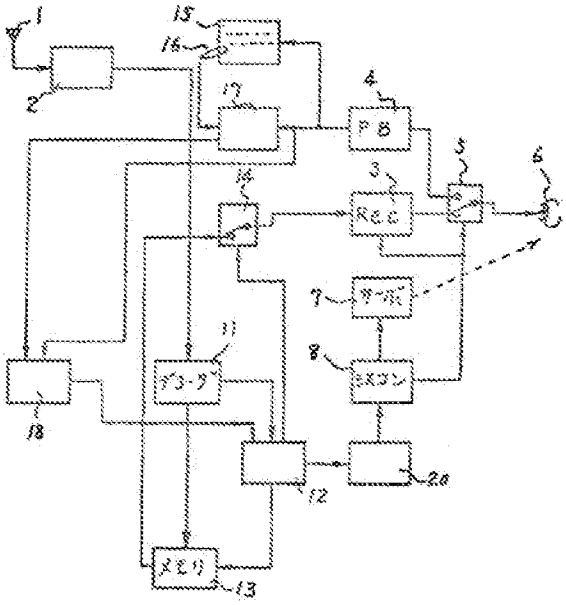
第3図


4
PB
2
3
5
Rec
6
7
8
9
10

第4図


1
15
16
17
2
4
PB
5
6
3
Rec
7
8
11
18
12
19
10

第5図


1
15
16
17
2
4
PB
5
6
3
Rec
14
7
8
11
18
12
20
13